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ABSTRACT

Master teachers can be influential in course revision. The Oklahoma Teacher Education Collaborative (O-TEC) teacher reform effort is a consortium of nine higher education institutions working with the National Science Foundation's (NSF's) reform effort to produce teachers better equipped for teaching science and mathematics. The reform emphasizes inquiry-based instruction for all teacher preparation courses. O-TEC plans to pursue systemic enhancement of teacher preparation by providing innovative teacher recruitment, reform of the undergraduate curriculum, and increased emphasis on retaining new teachers. Its programs are designed to attract, train, and retain teachers. O-TEC features summer academies that provide model teaching experiences for potential teachers. The program has multiple entry points. Each O-TEC institution has added a Master-Teacher-in-Residence to the faculty to assist in course redesign and participate in team instruction. These master teachers liaison with the community, develop connections with local school districts, observe classes, provide beginning teacher support, reform undergraduate block classes and methods courses, research causes of student failure, improve math labs, and plan summer institutes. Each institution has a site plan to enhance courses in science, mathematics, and education for preservice teachers. The revised courses reflect best practices in teaching and apply to real-world settings. Inservice programs for beginning teachers reinforce concepts taught during preservice instruction. O-TEC institutions stress the use of technology in preservice training and classrooms. (SM)

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American Association of Colleges for Teacher Education Proposal

I. Content

A. Statement of Presentation:

Master Teachers in Residence: Bringing a Classroom Perspective to Course Reform for NSF's Oklahoma Teacher Education Collaborative (OTEC)

Master teachers, with considerable classroom experience, can play a significant role in course revision. Experience has shown that they bring perspectives on classroom management, inquiry-based instruction, and the content that are needed for the reform of undergraduate curricula with science and mathematics courses. The OTEC teacher reform effort is a consortium of nine higher education institutions dedicated to producing teachers better equipped for teaching science and mathematics.

B. Literature Review

Universities across the nation are participating in reform initiatives to improve teacher preparation programs. The focus of reform is on the art of teaching (Herron, 1996) and the goal of teaching, i.e., learning. Learning is considered a criterion and product of effective instruction. Effective teaching requires focusing on both the content of the course and the process of learning (NBPTS, 1991).

Reforming science and mathematics teacher education requires change in teacher practices at all levels (NRC, 1996; NCTM, 1992). The consortium of higher education institutions, the Oklahoma Teacher Education Collaborative for Excellence in Teacher Preparation, is participating in the National Science Foundation's reform effort for mathematics and science education programs. The reform effort recognizes that preservice teachers need opportunities to develop theoretical and practical understanding and ability, not just technical skills (NRC, 1996; NCTM, 1992). The reform emphasizes inquiry-based instruction for all teacher preparation courses.

The intent is to shift the focus of teaching from traditional methods of instruction that emphasize memorization of facts and procedures toward inquiry-oriented methods that facilitate the development of conceptual understanding (NRC, 1996; NCTM, 1992; AAAS, 1993). The use of hands-on instruction designed to promote students' conceptual knowledge by building on prior understandings, active engagement with the content, and application to real-world situations (NRC, 1996; NCTM, 1992; AAAS, 1993).

C. Contribution

Oklahoma Teacher Education Collaborative

Project Overview

The Oklahoma Teacher Education Collaborative (O-TEC) is a consortium of higher education institutions dedicated to producing teachers better equipped for teaching science and mathematics to the students who will be the Oklahoma citizens of the next century.

The initial membership in O-TEC includes nine Oklahoma institutions of higher education. These encompass the major research universities (Oklahoma State University and the University of Oklahoma), a private comprehensive university (The University of Tulsa), four regional universities (University of Central Oklahoma, Northeastern Oklahoma State University, Southwestern Oklahoma State University, and Cameron University), the state's historically Black University (Langston University), and the state's largest two year institution (Tulsa Community College).

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Initial funding for O-TEC comes through a grant of $5,000,000 over five years from the National Science Foundation.

Project Objectives

O-TEC will pursue systemic enhancement of teacher preparation by providing:

1. innovative methods for recruitment of potential teachers;
2. reform of the undergraduate curricula with revised science and mathematics courses and stress field-based pedagogical instruction;
3. increased emphasis on retention of new teachers in their initial years in the classroom.

Programs

O-TEC provides a variety of programs to:

* attract (summer academies, multiple entry points).
* train (Master Teacher -In-Residence, revised science and mathematics courses, enhanced methods courses, field-based emphasis), and
* retain (entry year in-service, technology) teachers.

Summer Academies

O-TEC institutions host summer academies in which potential teachers, who may be undergraduates or well qualified high school students, participate in model teaching experiences designed by master teachers. The academies will emphasize the rewards and enjoyment of hands-on science and mathematics instruction.

Oklahoma State University and Langston University worked together on the "SPLASH" academy based on "water". Southwestern taught science and math content and teaching skills to prospective elementary teachers. Tulsa University worked in conjunction with Indian Camp Elementary School, Bartlesville Professional Development Center, and the Department of Energy.

Multiple Entry Points

Led by Tulsa Community College, O-TEC is devising innovative curricula and a two year degree program for paraprofessionals. The program has as its goals:

1. production of quality classroom assistants for Oklahoma's schools;
2. program courses which will articulate to the four-year universities if the para-teacher wishes to pursue a teaching credential.

During the summer of 1997, O-TEC sponsored:

1. a physics based workshop at Northeastern State University which featured calculator based laboratory activities and matched a high school student with a mentor teacher;
2. a mentor teacher workshop at Tulsa University which prepared area teachers for the supervision of "field experience" students and intern teachers. These master teachers will now be utilized by the university to offer quality supervision.

Master Teacher-in-Residence

Each O-TEC institution has added a Master-Teacher-in-Residence (MTIR) to the faculty to assist in course redesign and to participate in team instruction. Among the duties performed by our MTIRs are:

1. Liaison to the community at large;
2. Develop and maintain connections with local school districts;
3. Observe classes for purposes of evaluation and modification;
4. Beginning teacher support;
5. Reform of undergraduate "block" classes and science/math methods courses;
6. Research causes of college student failure/dropping of college algebra;
7. Math lab improvement;
8. Summer institute planning;
9. Faculty committee service

D. Conclusion

Revision of Mathematics and Science Courses

Each institution has developed a site plan to enhance courses in science, mathematics, and education, taken by pre-service teachers. The revised courses will reflect the best practices in teaching and be tied to real-world applications.

O-TEC has a series of faculty professional development workshops planned for our member I institutions. The first of these was held in February 1997 in Tulsa.

Entry-Year Inservice

O-TEC is developing in-service programs for entry year teachers to reinforce concepts stressed during pre-service instruction and to address concerns that may have developed during the initial year in the classroom.

Cameron University held the first Residency-Year workshop for O-TEC during the summer of 1997. The workshop emphasized integrating science and math using calculator based laboratory work.

Technology

O-TEC institutions stress the use of technology in pre-service training and its implementation in the classroom during the entry-year period. O-TEC institutions were awarded over $100,000 in technology grants in 1996. These awards were for the purchase of multimedia presentation equipment for use in teacher education.

Additionally, O-TEC

1. Operates a CU-SeeMe reflector which is available for use by any education institution;
2. Provides on-site technology service and training for area schools;
3. Maintains an information web page "http://129.244.43.78".

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